

Notice of Allowability

Application No.

10/809,066

Applicant(s)

MICKAEL, MEDHAT

Examiner

Art Unit

Faye Boosalis

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 22 January 2007.
2. ☒ The allowed claim(s) is/are 1-56.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S STATEMENT OF REASONS FOR ALLOWANCE

Comment on Submissions

1. This communication is responsive to submissions 22 January 2007.
2. The amendment filed 22 January 2007 has been entered.
3. The amendment to claim 40 has been accepted by providing a missing dependency and amendments to claims 1-20, 41-44, and 49-52 have been accepted by eliminating product and process in same claim.

Allowable Subject Matter

4. Claims 21-39, 45-48 and 53-56 were previously allowed in the Office Action submitted on 22 May 2006.
5. The remaining claims 1-20, 40-44 and 49-52 are now allowable.
6. The following is an examiner's statement of reasons for allowance:

Regarding independent claim 1, the prior art does not disclose or fairly suggest a system for measuring gamma radiation while drilling a borehole comprising an adjustment of gain of the detector by using a measure of slope of a Compton scatter energy region.

The examiner notes that while it is known in the art for a logging-while-drilling system to measure formation density obtained from a measure of intensity of backscattered radiation in the Compton energy range (see for example *Paske et al.* - US 4,698,501— at col. 1, lines 7-17 and col. 3, lines 38-41), upon reconsideration the prior art does not suggest an adjustment of gain of the detector by using a measure of

slope of a Compton scatter region to determine a correction factor to adjust detector gain to a standard gain.

Regarding independent claim 13, the prior art does not disclose or fairly suggest a system for measuring gamma radiation while drilling a borehole comprising result of the comparisons between observed position of a calibration peak from the calibration radiation and with a predetermined standard position for the calibration peak, are used to correct standard gain spectrum to a standard detector gain.

The examiner notes that while it is known in the art for a logging-while-drilling system comprising measuring concentrations of K, U, and Th using blocks, disposed outside of the logging tool prior to logging and later removed during logging, containing known concentrations of these materials and a gain correction circuit to adjust the gain of measured natural gamma ray spectra based upon results of fitting of measured spectra to a standard spectra (see for example *Galford et al.* - US 5,120,955 A— at col. 9, lines 47-50 and col. 10, lines 13-16), upon reconsideration the prior art does not suggest a means for using dual gain circuit to yield the same measured gamma ray spectra with a standard gain and a high gain.

Regarding independent claim 41, the prior art does not disclose or fairly suggest a gamma radiation logging-while-drilling system for measuring elemental concentration of at least one naturally occurring radioactive element in a formation penetrated by a borehole, comprising: a calibration source wherein the first gain correction determined from first component features of radioactive element and second gain correction from

second component from calibration source are combined to correct gain shifts in gamma ray detector.

The examiner notes that while it is known in the art for a logging-while-drilling system comprising measuring concentrations of K, U, and Th using blocks, disposed outside of the logging tool prior to logging and later removed during logging, containing known concentrations of these materials and a gain correction circuit to adjust the gain of measured natural gamma ray spectra based upon results of fitting of measured spectra to a standard spectra (see for example *Galford et al.* - US 5,120,955 A— at col. 9, lines 47-50 and col. 10, lines 13-16), upon reconsideration the prior art does not suggest a calibration source, as stated supra, to correct gain shifts in gamma ray detectors.

Regarding independent claim 53, the prior art does not disclose or fairly suggest a system for measuring gamma radiation while drilling a borehole, comprising: a gamma ray detector, with a processor, yield a spectrum at a range of about 3 MeV to comprise gamma ray count rate recorded as a function of energy channel.

The examiner notes that while it is known in the art of a density logging system to comprise a cesium source emitting 0.66 MeV gamma radiation and comprising two gamma ray detectors to measure Compton scatter radiation, induced by the cesium source, to determine formation bulk density (see for example *Hubner et al.* - US 4,524,273 – at col. 5, lines 60-65), upon reconsideration the prior art does not suggest a LWD gamma ray logging system embodied to measure natural occurring radioactive

elements (i.e. Th, U and K) emitting energy, broader than the range stated supra by Hubner, up to about 3 MeV.

The remaining claims 2-12, 14-20, 40, 42-44 and 50-52 are allowable based on their dependency.


Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Faye Boosalis whose telephone number is 571-272-2447. The examiner can normally be reached on Monday thru Friday from 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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